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Duncan Cable TV
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WILMINGTON, VT. 05363

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10 September 1993

Secretary of the Commission of the FCC
1919 M Street
Washington, DC 20554

RE: Rate Regulation Notice of Proposed Rule Making,
Mass Media Docket #93-215

Dear Sir/Madam:

I would like to take this opportunity to provide the Commission with important input with regards to cable companies such as Duncan Cable TV charging its subscribers for additional cable outlets. As a longstanding independent operator, I will provide the Commission with both philosophical and real world reasons why small cable companies like Duncan Cable TV must be allowed to charge for additional outlets.

Under the Commission's Rate Regulation Section 76-923H, additional outlet charges: " an operator may recover additional programming costs and the costs of signal boosters on the customer's premises if necessary associated with the additional connection as a separate monthly unbundled charge for additional connections". Under Duncan Cable's programming and affiliate contracts currently in effect, I cannot and do not charge any additional programming costs for the provisions of additional outlets. It is obvious from the Commission's statement above "costs of signal boosters" that the Commission is to some degree capable of understanding that more connections in a subscriber's home requires more signal amplification. However, it appears that the Commission does not realize that for practical and technical reasons the vast majority of this signal amplification cannot be located on a customer's premises. The in-home amplifiers the Commission makes reference to are, in most instances, simply not capable of providing acceptable signal to noise and cross-modulation levels to meet the Commission's own level of service standards. In the spirit of FCC technical standards compliance, operators might be capable of using this type of cable plant architecture in less that 1% of its distribution system.

I have 21 years experience as an owner/operator: planning, designing, constructing and maintaining every inch of the 45 miles of rural cable plant of Duncan Cable TV, in Wilmington, Vermont. From this small system operator knowledge and experience, I have prepared the following specific information in a

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sincere and determined effort to provide the Commission with real life small rural cable distribution design. The theory however, is fundamental and therefore applies to any size cable distribution system. The theory that I will demonstrate is that the architecture necessary for a cable company to provide adequate levels of signal for residential and/or commercial multiple outlet applications is an integral part of the design and constructed plant residing between the customer's tap point and the system head-end. Appendix A provides the technical design criteria I utilized for the purposes of this comparison.

The enclosed pages of technical information offer a comparison of two extremely different cable plants. If my company could be assured as it distributes its signal down the distribution system that each subscriber would only require enough signal to run one television, all costs associated with this system would be substantially less. However, due to the popularity of additional hookups, I must leave the tap point of a subscriber's connection with 15-19 db in order to provide enough signal to the 38% of my subscribers who have at least one additional installation. The on-premise couplers and additional in-home wiring to provide these customers with multiple outlets creates a greater amount of insertion loss. This necessitates the higher level of signal at the tap in order to provide adequate signal levels at the subscriber's television receiver. To achieve these higher levels of signal at the tap, larger more expensive cable, additional amplifiers and other related components must be installed throughout the off-premise distribution system. These additional equipment needs and subsequent costs are there only because those subscribers require multiple connections. Therefore, those customers should and currently do pay a justifiable and reasonable amount to assure the recovery of these costs. If these customers did not pay additional monthly charges, the alternative would be to recover these costs by raising the rates of single outlet customers. This would require 62% of my customers to subsidize the costs created by the other 38% who utilize and benefit from additional hookups. Considering the current negative consumerism and objections to cross subsidization in other industries such as health care etc., I cannot, in good conscience, allow this sort of unfair business practice to occur in my system.

**Design A.** illustrates the plant design required in order to provide adequate signal to those 761 additional outlets throughout my 1071 basic subscriber system. The design, for the most part, emulates my system's average span between poles, distance between taps etc.. My system is currently designed and spaced to 300mhz. Design A. represents a somewhat simplified version of the 450mhz upgrade I plan to make to my system in 1994. This design, as in my current system, provides 15db to19db of signal on the highest channel at the customers tap point. With this level of signal I will be able to provide adequate signal for up to 4 hookups. This design will be necessary to comply with the Commission's picture quality standards at the end of up to 3 additional outlets.

**Design B.** illustrates the plant design required to provide adequate signal for 1 hookup throughout my 1071 basic subscriber system. As in Design A., Design B. also emulates my system's average span between poles, distance between taps etc.. Design B. provides 8db to 12db of signal on the highest channel at the customers tap point. With this level of signal I will be able to provide adequate signal for 1 hookup. This design will be necessary to comply with the Commission's picture quality standards at the end of 1 hookup. Design B. represents a somewhat simplified version of the 450mhz upgrade I will be forced to implement if the illustrated additional plant costs in Design A. cannot be recovered through additional outlet charges.

Trilogy Communications 500 Mc/2 jacketed .109 messengered cable was utilized in both designs. This cable provides a loss characteristic of 1.35db/100ft. and is a self supporting design. This means it does not require a separate strand and subsequent lashing for aerial support. By design it has its own strand (.109") molded into the outer jacket which makes it completely self supporting. This feature is a very desirable and cost effective way for a rural cable company to construct its plant. Another advantage to this design is that the .109" size strand excludes the plant from all the normal guying requirements that otherwise would greatly increase plant cost.

As I mentioned, the tremendous difference in cost between the two designs is only a reflection of the fewer amplifiers and power supplies used in Design B. A reasonable question or comment when examining these differences might be, why not use a larger, lower loss cable? Schedule D. demonstrates this comparison by using the largest feeder cable possible, 640 Mc/2 Jacketed .25 messengered cable. As the design illustrates, an improvement in amplifier spacing and cost savings of $1,995.00 was realized. However, due to the increased size of the messenger (from.109 to .25) a cable company would be required to guy all attachments to power and telephone company specifications. Any savings realized by utilizing fewer amplifiers in conjunction with the larger, lower loss cable, would be more than off set by the higher cost of this cable ($640.00/m) and the additional expense of complying with the guying requirements.

Schedule C. illustrates the cost difference between design A and design B *for amplifiers and power supplies only*. These additional investments are only necessary because 402 of my subscribers desire more than one hookup. A 12% annual rate of return on the $140,940.00 worth of additional plant investment required to facilitate the 781 additional outlets calculates out to $21.66/year for each additional outlet. This breaks down to a monthly rate of $ 1.81. Routine maintenance and assuring compliance with things such as signal to noise ratio or CLI, adds significantly to this monthly rate. In my opinion, this proves beyond a reasonable doubt that Duncan Cable TVs' rate of $2.00/month for each additional hookup up to 3 and $1.50/month for each additional thereafter, is just and reasonable.

If these subscribers do not pay for these costs to provide additional outlets, then the remaining 669 single outlet customers will have to subsidize their service. This method of cost recovery would be unreasonable, unjustifiably and just plain unjust. This would be asking my single hookup subscribers, who in my opinion, are financially less capable than my multiple hookup subscribers, to pay for a service from which they will probably never benefit.

Over the last several years, I have constructed cable plant in areas that were well under the Vermont Public Service Board's homes per mile standards. Cable systems here in Vermont are required to construct plant without aid in contribution in construction in areas of 25 homes per mile or greater. I chose to construct plant in some of these areas due to the difference in revenue between all subscribers requiring one outlet and the reality that 38% would likely pay for multiple hookups. If the FCC either directly or indirectly does not allow rural cable companies to charge for additional outlets it will have done a grave injustice to the rural segment of our industry.

I am prepared to assist the Commission in any way I can to bring about a fair and reasonable methodology to determine rates for additional hookups, especially as it relates to rural cable companies like Duncan Cable TV.

Sincerely,

Clifford C. Duncan
Owner/Operator
Duncan Cable TV

# Appendix A

## Technical design criteria

Both schedule A & B utilize the average span between poles and taps currently in existence through-out my system in Wilmington, Vt. Taps and directional couples used are RMS industry standard products. I am currently using all of these products through-out my system here in Wilmington.

Trilogy Communications 500 Mc/2 cable was chosen for both designs due to it's loss characteristic of 1.3db/100' @ 450mhz.. Cost for this product effective Dec. 1992: $397.00/1000' FOB

Texscan series 1000 agc'd amplifiers were chosen for both designs due their higher output capabilities, and automatic gain control features making them ideally suited for rural applications. Cost for this product is broken down as follows effective Dec. 1992:

| | |
|---|---|
| Housing and base plate: | $ 446.00 |
| Diplex filter (2): | $ 100.00 |
| Forward amp. Model 235: | $ 401.00 |
| Return amp. Model 1655: | $ 359.00 |
| TACM Module: | $ 299.00 |
| Power supply Module443B | $ 135.00 |

Cost per Amplifier $ 1,740.00

RMS Power King series power supplies were chosen to provide the necessary AC power to run the amplifiers through-out both designs. My system here in Wilmington which uses this product exclusively, requires 1 power supply for every 13.3 amplifiers. Cost for this product effective Dec. 1992: $319.00 ea..

For the purpose of this comparison, the cost for Taps, Directional couplers and Connectors were not shown since it be almost the same for both designs.

The cost for labor was not shown but design A would have a greater labor expense due to the additional amplifiers and their required installation.

For the purpose of this comparison I used Duncan Cable TV's plant size of 45 miles to demonstrate the total plant investment cost differential between design A and design B.

Like my plant in operation, the average drop distance of 148' plus 96' of on premise wiring utilizing RG 6U Coax, yields a drop loss of 9.8db at 450 mhz..

***Design A:***

**Sketch of 1 cascade.** Each subscriber tap point will provide 15db to 19db.

```
40db
output          20            20            17            11            8             19.6db to
 A>---176'---0---176'---0---176'---0--176'---0---176'---0---176'---> next amp.
      -2.4    -.4    -2.4   -.4    -2.4   -.4   -2.4    -.4    -2.4    -.4   -2.4
```

Length of cascade or distance between amplifiers = 1056'

This multiple hookup design requires 5 amplifiers per mile of plant.
*Calculations:* 5 amps/mile x 45 miles of plant = 225 amplifiers.
225 amplifiers @ $1740 ea. = $391,500.
1 Power supply per every 13.3 amplifiers requires 17 power supplies.
17 power supplies @ $319 ea. = $5,423.

***Design B:***

**Sketch of 1 cascade.** Each subscriber tap point will provide 8db to 12db.

```
40db
output          26            23            20            20            17            14
A>---176'---0---176'---0---176'---0---176'---0---176'---0---176'---0-{
      -2.4    -.4    -2.4   -.4    -2.4   -.4    -2.4   -.4    -2.4   -.4    -2.4   -.8

               11            8             9.7 db
 }---176---0---176'---0---176'---> next amp
      -2.4   -1.5   -2.4   -3.3   -2.4
```

Length of cascade or distance between amplifiers = 1584'

This single hookup design requires 3.2 amplifiers per mile of plant.
*Calculations:* 3.2 amps x 45 miles of plant = 144 amplifiers.
144 amplifiers @ $1740 ea. = $250,560.
1 Power supply per every 13.3 amplifiers requires 11 power supplies.
11 power supplies @ $319 ea. = $3,509.

# Schedule C

## Cost comparison of Design A. and Design B.

| | |
|---|---|
| **Design A.** | **Cost** |
| This design is capable of providing up to 3 additional outlets to all subscribers through-out my 45 mile plant @ 450mhz.. Amplifiers and power supplies required ----- | $ 391,500.00 |
| **Design B.** | |
| This design is capable of providing 1 hookup to all subscribers through-out my 45 mile plant @ 450 mhz.. Amplifiers and power supplies required ----- | $ 250,560.00 |
| Additional plant investment required to provide additional outlets to 38% of my current subscriber base. (402 customers utilizing 781 additional outlets) ----- | $ 140,940.00 |